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(54) MEMORY SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a memory system capable of securing the protection of copyright at the time of using a flash memory card or the like.
SOLUTION: In the memory system using detachable storage media A-C and data stored in these media A-C, individual information for individually identifying each storage medium is stored in the storage medium, and in the case of utilizing data stored in the storage medium, the individual information of the storage medium is required. Individual information for individually identifying each of storage media A-C is stored in the storage medium, information related to each individual information is stored in data stored in each storage medium, and in the case of utilizing the data stored in the storage medium, coincidence between the individual information stored in the storage medium and the relative information in the data is checked and then the use of the data in the system is permitted.
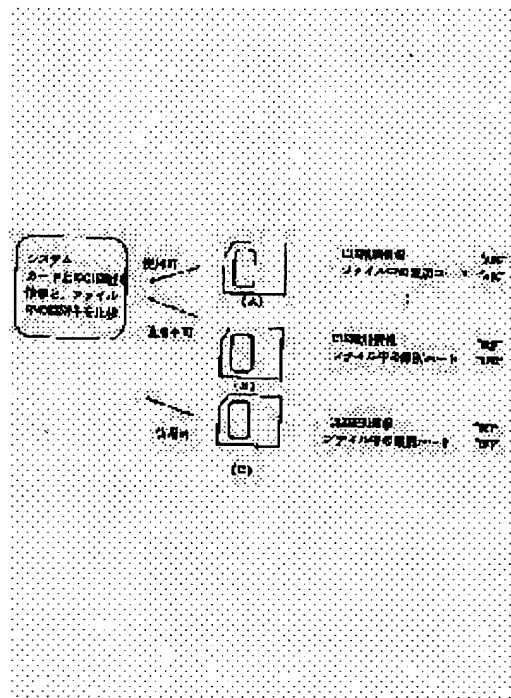
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* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention is used for the purpose of the protection of copyrights in the memory system which used semiconductor memory.
[0002]
[Description of the Prior Art] Flash memory card as shown in drawing 1 attracts attention as a storage of portable information devices, such as a digital still camera and PDA, in recent years. The flash memory to which few hollows are established in the thin plastic package, and this memory card has the flat electrode of 22 pins in that hollow is embedded. It connects with a host system electrically through the connector of dedication, and this flash memory card outputs and inputs data. For example, if a PC card adapter is used, it is possible to transmit the file on flash memory card to PC simply.
[0003]
[Problem(s) to be Solved by the Invention] However, in the above-mentioned **** memory system for flash memories, music data etc. had the trouble of the file in which copyright exists also having been copied freely and infringing on copyright. This invention was made in view of the above-mentioned trouble, and aims at offering the memory system with which protection of copyright is secured on the occasion of use of flash memory card etc.
[0004]
[Means for Solving the Problem] The individual information for identifying said storage according to an individual to said storage in the memory system which uses the data stored in the removable storage and said storage in invention which relates to claim 1 of the invention in this application in order to solve the above-mentioned technical problem is held, and in case the data stored in said storage are used, the memory system characterized by to need the individual information on said storage is offered.
[0005] Moreover, it sets to invention concerning claim 2 of the invention in this application. In the system which uses the data stored in the removable storage and said storage to said storage The individual information for identifying said storage according to an individual is held, and the information related with the above-mentioned individual information is stored in the data stored in said storage. In case the data stored in said storage are used, the memory system characterized by permitting use of said data in the inside of said system is offered after checking agreement of the individual information on said storage, and the information with which it was related in said data.
[0006] Furthermore, in invention concerning claim 3 of the invention in this application, read-out of said individual information offers the memory system characterized by being carried out by different approach from read-out of the data in a storage in invention concerning claim 1 thru/or 2.
[0007] Furthermore, in invention concerning claim 4 of the invention in this application, the memory system characterized by what is memorized by different data storage method from the data with which said individual information is memorized in said storage is offered in invention concerning claim 3.
[0008] Furthermore, it has information for said memory system to access said individual information in invention which relates to claim 3 in invention concerning claim 5 of the invention in this application,

and the memory system characterized by reading said individual information memorized by the same data storage method as the data memorized in said storage using this information is offered.
[0009]
[Embodiment of the Invention] The small flash memory card shown in drawing 1 is taken for an example. The flash memory to which few hollows are established in the thin plastic package, and this memory card has the flat electrode of 22 pins in that hollow is embedded. This example explains to an example the flash memory called the NAND mold EEPROM as a flash memory carried in the above-mentioned memory card. This flash memory specifies the physical format specification which specified the storing approach of data in order to take the compatibility of the data in a commercial scene.
[0010] In the case of the 16M bit NAND mold flash memory, the flash memory is divided into 512 physical memory block as shown in drawing 2 . This block serves as a smallest unit at the time of elimination. 1 block is further divided into 16 pages of Page0-Page15. 1 page becomes the fundamental unit of writing and read-out. 1 page consists of 264 bytes, inside, 256 bytes is used for a user data field (data division), and the remaining 8 bytes (redundancy section) are used for storing of an error correction sign, management information, etc.
[0011] Usually, in a personal computer, since data are managed per sector (512 bytes), this memory card also makes 2 pages a pair on the basis of data control per 512 bytes. The in-house-data configuration of a data area is shown in drawing 3 . As for the intact normal block, data division and the redundancy section are set as "FFh." Each cutting tool's semantics is explained below. Data As for Area-1, 0-255 bytes of data of the first half are stored among 512-byte data. Data As for Area-2, 256-511 bytes of data of the second half are stored among 512-byte data.
[0012] Data Status It is shown that data of Area are not normal. Usually, although it is "FFh", "00h" is set up when the data which are not normal are written in.
[0013] Block Status Area shows the condition of the good and the defect of a block. Usually, although it is "FFh", in the case of a bad block, "00h" (initial failure block) and "F0h" (late-coming bad block) are set up. When there are 2 bits or more "0", it is judged that it is a bad block. In addition, these data write in the same value altogether within the same block.
[0014] Block Address Area-1 shows the logical address information on a block. In addition, these data write in the same value altogether within the same block. BlockAddress Area-2 are Block. Address The same contents as the data of Area-1 are written. By control of this memory card, updating data are written in an eliminated field at the time of renewal of data, and since the method write-in [additional] of eliminating the field where the original data exist is adopted, by immobilization, there is no physical block in which the data corresponding to a certain logical block exist, and it is always moving in the inside of memory.
[0015] Therefore, like ****, he has memorized the logic block-address information which shows the data corresponding to which logical block are held in the redundancy section of a physical block. Usually, to a power up, this logic block-address information storing field of all physical blocks is searched, and the translation table of a logical block and a physical block as shown on System RAM at drawing 4 is made. Since the physical block corresponding to a logical block can judge immediately if this table is referred to once creating a table, search actuation of a whole block is good at one power up. When data are updated with a natural thing and the location of a corresponding physical block changes, the updating activity of a table is done and it prepares for the next access.
[0016] ECC Area-1 is the 3-byte ECC code of even-numbered page data (256 bytes). ECC Area-2 are the 3-byte ECC code of recto data (256 bytes). ECC (Error Correction Code) puts the sign for an error correction here. A system uses the sign for these error corrections, and when it judges whether the read data have an error and an error exists, it can correct an error.
[0017] What wrote down drawing 2 from another viewpoint becomes drawing 5 . Here, a thing called CIS (Card Information Structure) is defined. As mentioned above, in order to take the compatibility in a commercial scene in the above-mentioned memory card, the storing approach of data is specified. Above-mentioned CIS is a discernment field for judging whether it is based on the data storage approach which the memory card specified. CIS is arranged among effective blocks at a top block. If a top block

is not a bad block as shown in <u>drawing 5</u> , a CIS block will be arranged at the head of a chip. If the block of the head of a chip is a bad block, as shown in <u>drawing 6</u> , it will be arranged at the 2nd block.

[0018] CIS is divided into two fields as shown in <u>drawing 7</u> . One is the data area (field A) of immobilization. It judges whether it is based on the specified data storage approach using 10 bytes of head of this fixed area. A system reads 10 bytes of head of a power up and a CIS block, if in agreement with what the value was specified as, shall be based on the data storage approach by which the card convention was carried out, and will advance processing. If specified 10 bytes cannot be read, a judgment of a strange format article is made and the processing after a destructive **** sake of data is stopped.

[0019] A CIS field is a field which can refer to only a system (for example, controller in an adapter card), and ordinary end users cannot refer to it. For example, when it stores a file through an adapter card, a file is stored using locations other than a CIS field including the management domains (the master boot sector, the partition boot sector, FAT, directory, etc.) and the body of file data of a file. Therefore, from PC, a CIS field is not visible, unless a special means is used. Another field (field B) of CIS is a field which can set up the data of arbitration. Of course, an end user cannot necessarily set up the data of arbitration. Data are set up by the phase where this flash memory card is shipped, or the special tool.

[0020] The approach for the protection of copyrights on the flash memory card of the above conventions is concretely explained using the example of 1 to 11 below. sounds as that by which protection of copyrights should be carried out for example, such as classical music and popular music, -- all of things which copyright generates legally, such as image data, such as image data, such as character data, such as the popular character of voice data, such as alphabetic data, such as data of linguistic teaching materials, such as easy data and English conversation, literature, and a magazine, a newspaper, a public performance and an interview, a comic story, and a comic dialog, and animation, and scenery, map data, voice guidance data, local information data, and a portrait, be contained. Moreover, also when there is need of data protection, such as a certain copy protection, to the data which copyright does not generate, it is possible to completely deal with it similarly. These are named generically in the following explanation and it is indicated as a work or contents.

[0021] (The 1st example) Below, the 1st example of the memory system of the invention in this application is explained. This example aims at sale in the condition of having memorized the work beforehand to a flash memory.

[0022] Although various level of writing protection is considered, identification code is beforehand written in the CIS field (the field B of <u>drawing 7</u> , field in which a data setup of arbitration is possible) of flash memory card.

[0023] For example, the system instruments (for example, a music playback machine, an image display machine, etc.) of the 1st example expect the character string of "ABC" as identification information of CIS of flash plate memory card to be shown in <u>drawing 8</u> . "ABC" and two kinds, what was written in (A), and "DEF" and the written-in thing (B), are assumed to the identification information of CIS as flash plate memory card. When actual, identification information is not restricted to three characters, but more ones are [the number of alphabetic characters (an alphabetic character etc. is included)] good. Here, in order to simplify explanation, the case of three characters is explained to an example. In the case of <u>drawing 8</u> , since the character string of "ABC" is expected as identification information of CIS, a system instrument can be normally used, when the card of (A) is inserted in a system. However, since the card of (B) does not have the expected identification code, it cannot be used with this system instrument. Generally identification code is not exhibited, only the memory card which wrote in the identification code of "ABC" in this case, and was sold becomes usable at a system instrument, and the right of the work inside a memory card is protected.

[0024] In (B), level [that it cannot be used] can assume many cases. For example, if it is music, it will be assumed that only a part can listen to the music other than the condition of saying that music cannot be listened to at all. This corresponds to the case where only the part of ******** is good, for example, for promotions. Moreover, chisels, such as a small thumbnail image with which the image other than the

protection approach that an image does not appear at all appears only as for a part if a system is an image display machine and only the image in the conditions (mosaic screen etc.) that the scramble started appears, appear, or when other, you may make it a very high definition image appear, if it is the card of normal, and only a coarse image with low definition appear. Moreover, if it is the card of normal, a certain function can be used, and if it is except it, you may prevent from using a certain kind of function. For example, in the case of music, with the card of normal, the function of search can be used like a CD player, but with the other card, a certain limit may join functions of a system instrument -- the function cannot be used. With the card which has the identification code of the expected normal, and the other card, if there is a certain difference, the purpose will be attained.

[0025] However, by the above-mentioned approach, if it is the card with which the identification code "ABC" expected was written in, it is considered that all are the cards of normal and the own justification of a file memorized may be unable to judge. That is, once the card which has the identification code of "ABC" depending on a situation comes to hand, the case where the inaccurate data which came to hand from the inaccurate WEB site on the Internet on the card become usable will be assumed. Moreover, if the identifier expected at the time of system instrument manufacture is decided uniquely (it is "ABC" in the case of this example), even if it is going to sell the card of normal with identifiers other than "ABC", it cannot do. For this reason, it is possible to have the function which carries out modification or an addition of expected value using a certain means. For example, the software to which the expected value of a system instrument is changed or added is put into the card of normal itself, and it may be used and you may have the means of changing and adding the expected value of a system instrument. Or the system itself has beforehand the software which changes the expected value of a system instrument and is added, and only a modification value may make it exist on a memory card with a certain convention thing. A system by which expected value is not changed using the information on a card, of course, for example, a system instrument is connected with PC etc. a cable etc., and expected value is changed by it may be used. Expected value should just have the function changed and added by a certain technique after shipment of a system instrument.

[0026] (The 2nd example) Next, the 2nd example of the memory system of the invention in this application is explained. This example as well as the 1st example is aimed a flash memory at sale in the condition of having memorized the work beforehand.

[0027] The outline of the 2nd example is shown in drawing 9 . In this example, the information relevant to the identification code which the file itself stored was made to memorize to CIS is incorporated at the same time it makes the CIS field of flash memory card memorize identification code.

[0028] For example, as shown in (A) of drawing 9 , when the identification code of CIS of this memory card is "ABC", the information relevant to identification code "ABC" is incorporated in the file in a card. The case where a character string "ABC" is incorporated as it is for simplification is assumed.

[0029] A system instrument reads the identification code in CIS of flash memory card first. In the case of drawing 9 (A), "ABC" is read. Next, a system reads the predetermined location in the file in a memory card. If "ABC" is read at this time, that file will be recognized to be the file of normal.

[0030] Temporarily, like drawing 9 (B), when not a character string "ABC" but "DEF" is read from the predetermined field of a file, the file judges it as the file copied from another flash memory card via PC etc., and forbids or restricts the use on a system instrument. About the concrete contents of the limit, it applies to the contents explained by 1 of an example.

[0031] If the identification code in CIS and the identification code of a different point from an example 1 in a file correspond as shown in drawing 9 (C), even if it does not know those information at the time of manufacture of a system instrument, it will be a point which becomes usable. for example, a system instrument -- a sound -- the case where it is an easy playback machine -- the identification code in a CIS field -- a singer name -- or it is equivalent to an album name etc. Since it is reproducible if it is the music memorized by the flash memory card of normal even after a new singer appears or a new album is made, this example can sell a system instrument satisfactory.

[0032] This example is not restricted to the above-mentioned approach. Suitable relating for flash plate memory card and a work is just performed. Although the above-mentioned example explained the case

where the character string in a CIS field was incorporated in a file as it is, it can change variously in the range meeting the main point of invention. For example, the character string incorporated in a file does not necessarily need to be completely in agreement with the character string stored in the CIS field. It may be made to store with reversed "CBA" to "ABC", and it is good also as "BCD" shifted one character in the alphabetical order to "ABC", and several characters may be shifted. Moreover, a figure is assigned to an alphabetical order to the alphabetic character of "ABC", and it is good also as "123." According to a certain convention, if the relation between the identification code in a CIS field and the identification code in a file is materialized, it will have agreed with the main point of this invention. Moreover, the identification code and the number of alphabetic characters in CIS do not need to be in agreement. Even if it changes and stores the numbers of alphabetic characters, such as "ABCDEF" or "ABCABC", to "ABC", if a certain convention exists, it is satisfactory at all.

[0033] As an approach of furthermore raising dependability, identification code in a CIS field may not be simply stored in a file, but what the information relevant to the identification code in a CIS field is included with other data in a file, and enciphers may be done. When simply stored in a file, the storing location of the information relevant to identification code may be pinpointed by comparing the file data with another identification code of the memory card of several sheets. In order to avoid this, by the approach of migrating to a certain amount of large field, and enciphering, the difference part of the file data of several cards is increased, and dependability can be improved. What is necessary is just to have the code key which solves what was enciphered in the ASIC middle class by the side of a system instrument. Or a format which is sold together with a work is sufficient as the code key itself. Moreover, the information related with the identifier of a CIS field does not necessarily need to be contained in the file at each. Another file (for example, file in which the musical piece name was stored) carried out in relation to the contents of the work may have integrative.

[0034] Although a transfer of a file can be normally performed supposing the person who purchased the memory card into which the work of one sheet went by the approach of normal once transmits the file of the work on PC and transmits a file to the memory card of an another sky by this example On the memory card of the conventional empty to which the file was newly transmitted, since just relation is not realized between the information related with the identification code of a CIS field, and the identification code in the transmitted file, it can be easily judged by the system instrument side. Use of an unjust copy is restricted by this. In case this transmits data to PC using a general-purpose adapter card etc., in order to check whether the controller in an adapter card is based on the standard format, a CIS field is accessed, but unless a special approach is used, it cannot perform that the software on PC etc. accesses a CIS field, but even when a file can be transmitted, the identification code in a CIS field itself uses skillfully the structure of not being transmitted to other memory cards. An example is shown for the outline of this example in <u>drawing 10</u> . "ABC" is contained in the flash plate memory card of normal as identification code of a CIS field, and the identification code in a file is also "ABC." The file of this flash plate memory card is once transmitted to PC. Next, a file is transmitted to another flash plate memory card from PC. in this case, the identification code of the CIS field of the memory card of the destination -- "DEF -- " -- it is -- identifier [in the transmitted file]" -- ABC -- " -- therefore it is not in agreement, a system side can be judged as what has recognized both inequality and was copied unjustly

[0035] Moreover, the code assigned for every work is sufficient as the identification code of a CIS field, and the code of a proper is sufficient as it to a proper or a certain group for every one flash memory card. When 1 byte is simply assigned to an identification code field, 256 kinds of setup from 00h to FFh is possible. Although a memory card with the same identification code will exist in 256 sheets by the probability of one sheet when it writes identification code at a time in one flash memory card in order, the probability which discovers another memory card in which ordinary end users had the same identification code is very small. If a byte count is increased, the probability can bring identification code close to zero infinite. What is necessary is just to assign the number, for example for every album, even when assigning 1 byte. Since the file which can be copied will be the same file mutually and it will be the work with which both bought the right justly even if a memory card with the same identification code is discovered, there is no semantics in copying.

[0036] Moreover, the information related with the identification code in a file is a wide sense. The file is enciphered on the whole or partially, and the key which solves the code could be connected with the identification code itself or identification code. In this case, the thing which solve a code normally and which is put in another way as the ability not to solve is possible for the agreement with the information related with identification code and the identification code in a file, and an inequality.

[0037] As mentioned above, the copy of an inaccurate work is prevented by performing correlation of the flash memory card itself and a work.

(The 3rd example) Next, the 3rd example of the memory system of the invention in this application is explained. Although this example considered the case sold out where a work is beforehand stored in flash memory card in the 1st and 2nd example of the above, this example is about a case which receives a work for the purpose of sale of the information of a work itself in the form where it downloads to the flash memory card currently sold to usual.

[0038] For example, the terminal of dedication is put on a convenience store, a station, and others, and information is downloaded through the terminal. These are the terminals of dedication and can carry out reference or rewriting for a CIS field freely. Namely, the result of having written in data on the above-mentioned dedicated terminal should just be the same as the condition at the time of sale of the memory card which was explained by 1 and 2 of an example and which stored the work beforehand. Namely, the identification code of a CIS field is rewritten at the time of informational storing, and a work should just be stored as a file which incorporated the information related with it.

[0039] At this time, use of the work stored conventionally becomes impossible by rewriting a CIS field. However, if it has two or more identification codes in CIS, it can use, without stopping use of the file of the normal which had already existed to data download of multiple times.

[0040] As a dedicated terminal which writes in data, it is not restricted to the above-mentioned example. The function of this above-mentioned dedicated terminal may be given to automatic vending machines, such as juice which has spread through a world widely, etc., and this may be used. In this case, renewal of a work may be performed to coincidence in the case of a supplement of the selling object of an automatic vending machine, and the work sold by a wireless function or cables, such as a PHS function, may be updated.

[0041] Moreover, it is also possible to use a public telephone etc. The connector which can insert flash memory card may be attached to a public telephone etc., a public line may be used, and a work may be distributed. The same thing can be assumed even if it minds PHS, a cellular phone, etc. Or the case where data are received from satellite broadcasting service etc. and CATV can also be assumed. Of course, it is possible for the same to be said of PC. A tool with the function as for which the data of a CIS field are made to reading outside may be prepared. If a tool connectable with the USB port of PC, a serial port or a printer port, an ISA Bus slot, etc. is controlled by software of dedication, it is also possible to access a CIS field like a dedicated terminal, and to refer to or change identification code etc. the adapter card of a type with which it is not based, for example on a PC card ATA interface, but a user installs a device driver himself although the above-mentioned explanation assumed the general-purpose adapter which had a device driver in PC as standard like a PC card ATA interface also by the adapter -- it is -- an object accessible to a CIS field -- or what is necessary is to use a thing with the same function and just to use the download software of dedication

[0042] Moreover, this invention is applicable besides the flash plate memory card shown in drawing 1 . For example, the case of the flash memory card based on a PC card ATA interface is explained below.

[0043] A PC card ATA interface applies the protocol of the hard disk of an IDE specification to a PC card as it is. Generally the small-scale flash memory (controller built-in may be carried out) for storing RAM for a controller or buffers and the firmware other than a flash memory etc. is carried in the interior of the above-mentioned ATA card.

[0044] The approaches of storing the thing equivalent to the identification code of the CIS field of the above-mentioned example in this ATA card are variety idea ****. For example, attribute room is defined as the PC card and the host system judges the classification (for example, an ATA card, a modem card, a LAN card, etc.) of a card by referring to this field. The contents of this attribute room are

called a tuple and standardized by the PC card standard etc. The field where a card vendor can set up vendor information and product information is in this specification. If this field is used, the actuation meeting the main point of the above-mentioned example will become possible. You may have the set point in this case on the nonvolatile memory in a controller, may have it in nonvolatile memory, such as a flash memory connected with the controller, and may have it in the flash memory of Maine for file storing in a card. Moreover, the same actuation is possible also except the above-mentioned attribute room. A command called Identify Drive is in the protocol of ATA (Hex Code Ech). This command is a command for notifying the specification value (for example, the number of sectors, a number of cylinders, the number of heads) as a hard disk to a host side. The field which stores a model number, the version of a built-in microcode, etc. is in the return value of this command. What is necessary is just to store the thing equivalent to the identification code of the CIS field of the above-mentioned example in this field. It is arbitrary like **** in what place in an ATA card the value is stored. Moreover, the value may consider versatility, in a rewritable condition is sufficient as it, and it is good also as a condition which cannot be eliminated and rewritten in order to raise security.

[0045] moreover, a new vendor -- a unique command may be used. You may make it the use which outputs the value equivalent to the identification code of the CIS field of the above-mentioned example using the command except being prescribed by the protocol of ATA. For example, F3h may be set up with an identification code read-out command, and the command input of multiple times, such as F3 h-F4h, may be needed. Identification code may be outputted from the 1st byte and you may make it output a certain value (for example, Aah) which shows that this command is supported by the 1st byte or the specified byte count as an output method from a card. Another command for judging whether, of course, this command is supported may be prepared. The byte count of an identifier is arbitrary. In order to give adjustment with other commands, the specification which reads the data for one sector (usually 512 bytes) is also available at all. Moreover, as implications are extended using the command which exists from the former, it is peach furnace ******. For example, Read long A command (22h/23h) transmits data to a host after 512-byte data transfer including an ECC cutting tool from a drive. The information equivalent to identification code may be contained into this cutting tool. Moreover, if a certain specific sector is accessed, you may specify that the thing equivalent to the above-mentioned identification code is outputted, and you may decide that sympathy news is obtained by accessing sectors other than the address space (the number of sectors) currently supported. Moreover, the controller carried in the card compares itself the information about identification code and the above-mentioned identification code stored in the file, and when it differs, you may make it forbid the output of a file. What is necessary is to incorporate the information which the memory card stored identification code by a certain approach, and was further associated above by this identification code also in the file like, and just to be able to have the function which both can compare as the whole system.

[0046] Moreover, application of this example is not restricted only to the above-mentioned ATA card. The card carrying the controller (it is not necessary to necessarily carry CPU and you may consist of easy comparison ASIC etc.) of a different type and the card which carried memory other than a flash memory (FRAM, SRAM, MROM, DRAM, etc.) further are sufficient as various kinds of memory cards which do not carry the controller, and an ATA specification, and various kinds of memory may be loaded together. A flash memory cannot adhere to an AND mold besides the NAND mold flash memory currently used by the memory card shown in drawing 1 , a NOR mold, a DINOR mold, and flash memory classification, and can be applied also to nonvolatile memory other than flash memories, such as the cutting tool mold EEPROM and Serials EEPROM and EPROM. Moreover, it is possible to completely argue similarly to storages other than semi-conductors, such as CDROM, and DVD, MD, LD, HDD and FD. There is a file stored in the storage and the storage, the identification code of a proper was memorized in the storage, and if the information associated by the above-mentioned identification code in the file is stored, the main point of this invention will be satisfied.

[0047] Moreover, the information related with the identification code in a file is a wide sense. The file is enciphered on the whole or partially, and the key which solves the code could be connected with the identification code itself or identification code. In this case, the thing which solve a code normally and

which is put in another way as the ability not to solve is possible for the agreement with the information related with identification code and the identification code in a file, and an inequality.

[0048] About the approach of processing when there are the maintenance approach of identification code, the comparison approach of both information, and a difference, it has very large optionality. (The 4th example) Next, the 4th example of the memory system of the invention in this application is explained. This example explains how to raise further the dependability in the case of the above-mentioned examples 1-3 below. Even if this example combines with examples 1-3, it is usable, and it is also possible to use it by example 4 independent one. It is characterized by this example forming intentionally the condition of differing from the condition of using the structure of the storing specification (physical format) of the already explained standard data, and having been normally stored in the standard physical format, in part.

[0049] For example, Data Status There is the approach of using Area. It is Data like description. Status It is shown that the information of Area stored is not normal. Usually, although it is "FFh", "00h" is set up when the data which are not normal are written in. For example, in the case of an adapter card, it is Data. An error is returned when the sector (data are not normal) with which the mark is given to StatusArea has access from a host system. Therefore, it is Data with PC etc. Status A file including the field which the mark attached to Area cannot be transmitted. It is possible to prevent an unjust copy using this.

[0050] The outline of this example is shown in drawing 11 . File A is Data to either of the data in a file. Status The mark is given to Area. Data of File B Status Area is normal. For example, if the case sold where a work is beforehand stored in a memory card is assumed, File A corresponds to it. It is Data in the phase of storing a work. Status A mark is given to Area and a file is stored. If the storing field of File A has access when it is going to transmit a file to up to PC in this condition using a general-purpose adapter card etc., it will judge that the applicable data of the controller in an adapter card are not normal, and an error will be returned to a host. On this time, for example, PC, the message "abnormalities are in a drive" etc. is displayed on a screen, and a transfer of a file is interrupted. Data Status Data transfer is freely possible for the file B which does not have marking in Area to PC.

[0051] Thus, the inaccurate file copy of a work can be prevented by carrying out file storing, where the mark which shows that data are not intentionally normal is given. Of course, a system side (for example, music playback machine) is Data. Status He understands that the mark of Area is attached intentionally and it is dealt with as that in which right data are stored. Therefore, Data Status To attach a mark to Area intentionally, it is necessary to decide to which field a mark is attached beforehand. The grant location of a mark can assume various cases. For example, a mark **** case is considered to each file. Of course, you may mark to each sector of the whole file. Moreover, only a part may be given. For example, it is the approach of arranging for using the sector of what [the] position of a file for the purpose. The data which mark may be set up beforehand. For example, all the data of 1 sector may be set to FFh, and you may make it the specification which marks to the sector. The location which marks is not restricted with under a file. For example, the file management field of DOS is sufficient. You may mark on a master boot sector field, a partition boot sector and a FAT field, a root directory field, a subdirectory field, etc. If a mark is attached to a master boot sector field etc., since it becomes impossible to recognize as a drive, a transfer of a file will become impossible from on PC. Data Status The mark of Area is effective to lead actuation. If a write-in instruction is newly published to this field, new data will be written in, and it is Data. Status The mark of Area disappears. Therefore, it is also possible the card which the anti-copying device attached by this invention to music playback, and to also write in another file and to reuse by another system, if the file of relevance becomes unnecessary. When the different condition in part from an original normal condition of becoming is formed intentionally and a general-purpose system judges the condition, in the range of the main point that an unjust copy can be prevented, this example can be changed variously and can be applied. If it has another way of speaking, read-out actuation of data will be permitted to the body of data according to the contents of the management information memorized additionally, or it will forbid it. Although a built-in controller looks at an applicable field and returns an error in an ATA adapter card, the thing with the same device

driver on PC to judge cannot be overemphasized at the adapter card of the type which does not contain a controller. An error returns and various kinds of approaches also as a direction can be considered. In the case of an ATA adapter card, the purport host whom the reading error which cannot be corrected generated may be notified, a purport notice (command abort) may be given [into which the inaccurate command was inputted], and the error code which means that the specified sector was not able to be discovered etc. may be returned. An error returns and it is arbitrary as a direction.

[0052] Next, Block Status How to use Area is shown. It is Block like description. Status Area shows the condition of the good and the defect of a block. Usually, although it is "FFh", in the case of a bad block, "00h" (initial failure block) and "F0h" (late-coming bad block) are set up. When there are 2 bits or more "0", it is judged that it is a bad block.

[0053] To a power up, a system searchs this logic block-address information storing field of all physical blocks, and usually makes the translation table of a logical block and a physical block as shown on System RAM at drawing 4 . Since the physical block corresponding to a logical block can judge immediately if this table is referred to once creating a table, search actuation of a whole block is good at one power up. When data are updated with a natural thing and the location of a corresponding physical block changes, the updating activity of a table is done and it prepares for the next access. A system is Block first in the case of the whole block search of showing-in drawing 4 table creation time. Status Area is referred to first. Here, it is Block. Status When the mark is given to Area (it has the symptom of writing not being made or the error which cannot be corrected having occurred with a poor block electrically, or it was not eliminable), a system is Block to an applicable block. Address The routine which creates a table with reference to Area etc. is stopped, and processing is moved to the following block. Therefore, a bad block is not again accessed till the next power-source reclosing. Therefore, with a general-purpose system, it is Block. Address The in-house data of the bad block which the mark attached to Area is not referred to.

[0054] How to protect a work using this structure is described below. That is, the information memorized by the block with which the bad block was registered is used for protection of copyrights. For example, as the above-mentioned examples 1-3 indicated, the identification information of a memory card etc. is seen and it stores in the upper bad block. An outline is shown in drawing 12 . The system (for example, music playback machine) expects agreement with the information related with the identification code memorized in the bad block, and the above-mentioned identification code embedded into the file. The work with which it is memorized by this memory card since the identification code by which the identification code in a bad block was embedded by "ABC" with the card of drawing 12 (A) at the file is also "ABC" and its both correspond can be judged as the work of normal. On the other hand, since a difference is looked at by the identification code embedded by the identification code in a bad block at the file, (B) of drawing 1212 and (C) judge it as that by which the work memorized was received unjustly, and add a limit to processing. The work of normal can be distinguished by carrying out comparison examination of the information connected with the identification code in a bad block, and the identification information embedded into the file as mentioned above.

[0055] The congenital or acquired bad block exists in a memory card. The approaches for specifying the bad block in which identification code is stored are various idea ****. For example, the data for checking that identification code is contained should just be memorized by the applicable block. For example, the data "AAh-55h" are written to the cutting tool of the beginning of the head page of a block. Or two or more (1 sector or two or more sectors) individual writing **** is sufficient in the identification code itself, and identification code may be stored with the result (for example, parity and a checksum) of having performed a certain count using it. The technique to which a probability becomes [whether it is in agreement with the approach of storing identification code by chance, and] is incorporated, and they should just be [the data which exist in the true bad block by chance are clear, and]. Moreover, when the Ruhr of using it from the block near the head or the last of a chip is decided, it is early that an applicable block is found. As information stored in the bad block on appearance, it is not restricted to the above-mentioned identification code. For example, when a system is a music playback machine, the information related with the file name which can be heard by the media of

relevance is contained, and you may make it forbid playback of the other musical piece file. It is the essence of this invention to have a means by which the justification of a work can be checked based on the data which formed intentionally the field which a general-purpose system does not access, and were stored in the field.

[0056] Like ****, it is Data. Status Area and Block Status Also in other fields which explained and which are shown in <u>drawing 3</u>, the same actuation is possible about Area. It is possible and it is Block similarly to also use 4 bytes of field Reserved(ed) for use of current and the future with the same main point. Status It is also possible to use Area. Block Status The object same at a time as each two sectors is stored, for example, Area is 1 with a 16-megabit (2 megabytes) article. 16 area exists in the block of an individual. Usually, Block of the head of each block of a system, or the last sector Address Only Area is referred to. Therefore, Block of the middle sector within a block Address It is also possible to use Area by the same main point as what has so far added explanation. Above Reserved Area and Block Address In the field characterized by forming intentionally the condition of differing from the condition that use of Area was also normally stored in the standard physical format, in part, it is Block. Status Area or Data Status It is the same main point as the operation of Area.

[0057] Although it is also possible to use this field like the above-mentioned example, of course although only the area of an ECC sign has not added explanation yet among each area of <u>drawing 3</u>, it is possible to use it from another viewpoint.

[0058] ECC (error correction code) is used in the flash memory card shown in <u>drawing 1</u>. About the detail of the method of ECC, although it omits since it is not directly [the main point of this invention, and] related here, ECC which has detection of two bit errors and the capacity of correction of one bit error to 1 sector (dividing 1 sector into two correctly and receiving each 256 bytes) is used.

[0059] Here, the case where it downloads from sale in the condition of having stored the work in flash memory card beforehand like the old argument, or a dedicated terminal is assumed. For example, a work is stored after the ECC error has occurred intentionally. In this case, an outline is explained using <u>drawing 13</u>. Here, in order to simplify explanation, the condition of having made the storing field of a file name generating an ECC error intentionally is made. If a file name is set to "ABC", as actual data, it is stored with 41h, 42h, and 43h. Here, the sign of ECC is adjusted and it considers as the condition that the error has occurred to the field of "ABC." For example, if corrected with an ECC sign, it will adjust so that it may be set to "ACC" (41h, 43h, 43h). The controller in a system (for example, music playback machine) etc. recognizes the part which the ECC error has generated intentionally. Therefore, only 41h, 43h, 43, and the file currently written in recognize a system to be the work of normal. Suppose that a file is transmitted to up to PC through an adapter card etc. here, and a file is transmitted to still more nearly another memory card. In this case, in case a file is transmitted to PC from the memory card of normal, by the controller in an adapter card, the error formed intentionally will be corrected automatically and a file name will change to "ACC" from "ABC." The name of the file finally transmitted to another memory card serves as "ACC." When this memory card is inserted in a system, since the controller in a system is not "ABC" which the file name expects, recognition that an applicable file is copied unjustly is possible for it. Although the file name was mentioned as the example here in order to simplify explanation, another field of actually applying this example, since an end user can rewrite a file name easily with PC is suitable. It is satisfactory if the location which has taught the error intentionally is specified beforehand. Moreover, *********** [parts / two or more / the part which has an error generated intentionally may not be restricted to one place, and]. The location which marks may be [******] under file. For example, the file management field of DOS is sufficient. You may mark on a master boot sector field, a partition boot sector and a FAT field, a root directory field, a subdirectory field, etc. If the file transmitted to PC through the general-purpose adapter etc. has the file and a certain difference of normal of the source and is copied, the main point will be satisfied.

[0060] Although one bit error which can be corrected was intentionally generated in the above-mentioned example, the error of 2 bits or more which cannot be corrected may be generated intentionally. In this case, if it is going to transmit a file to PC using a general-purpose adapter card etc., the controller in an adapter card will detect a correction impossible error, and will notify generating of

an error to PC, and a transfer of a file will be interrupted. It means that it was prevented that a file is copied from the memory card of normal as a result. Of course, the location which generates two bit errors intentionally as mentioned above is arbitrary. Moreover, when the error more than a triplet is generated intentionally, this structure by which an error may not be detected or may be incorrect-corrected may be used. Moreover, the information related with the identification code in a file is a wide sense. The file is enciphered on the whole or partially, and the key which solves the code could be connected with the identification code itself or identification code. In this case, the thing which solve a code normally and which is put in another way as the ability not to solve is possible for the agreement with the information related with identification code and the identification code in a file, and an inequality.

[0061] (The 5th example) Next, the 5th example of the memory system of the invention in this application is explained. Although sale in the condition of having made flash plate memory card memorizing a work beforehand has been considered in the above-mentioned examples 1-4, the especially existing hard use will be the requisite from on the Internet in this example supposing the case where a file downloads through PC. For example, a general-purpose adapter card is assumed. When once downloading as a file on the hard disk of PC from the Internet and transmitting an applicable file to flash plate memory card through a general-purpose adapter, the case which cannot use the structure of the protection of copyrights using the hierarchy of a physical format like the above-mentioned examples 1-4 is assumed. In case a file is transmitted to flash memory card through an adapter card, for example from PC, it is because PC cannot refer to the CIS field of a memory card. Therefore, actuation in which the identification code in a CIS field is incorporated in a file becomes impossible.

[0062] The structure of the outline of the protection of copyrights in such a download system is shown in drawing 14 . The information on a proper (in order to facilitate explanation below, it is only described as an equipment item number) is given to the system instrument (for example, music playback machine) here at system instrument each. Although the respectively completely identifiable thing of an equipment item number is desirable, when there are two sets of devices, the probability for two sets to have the same equipment item number should be just small. Moreover, they may be uniting with a thing like a manufacturer's serial number like [a continuous number is sufficient and] a random number. Various the grant approaches of an equipment item number are considered. The approach that a metal plate is stuck on the sheathing part of a system instrument may be used, and you may be in an interior part (for example, cell storing part). Moreover, structure which is displayed on the display of a system instrument is sufficient, you may show around with voice, and it may be indicated by an operation manual, the guarantee, etc. Namely, there should just be structure an end user can recognize the equipment item number of a system instrument to be. This equipment item number still requires that the controller inside a system instrument should refer to freely. For example, you may memorize on the nonvolatile memory inside b controller, and it may be stored on the nonvolatile memory connected with a controller through a bus. If backed up by the cell, you may memorize on memory, such as SRAM and DRAM. Moreover, you may memorize with mechanical means, such as a DIP switch. Just refer for that to which a controller is equivalent to with an electric means.

[0063] The download approach from the Internet is described concretely. On the web (WEB) which performs a music distribution, a musical piece to download is selected and the equipment item number of the owned system instrument (music playback machine) is inputted. Then, it downloads to the hard disk of a user's PC etc. in the form where the information closely connected with the equipment item number or the equipment item number in the file was incorporated. Of course, proper accounting is carried out by approaches, such as an input of a credit card number.

[0064] The file by which the information relevant to the equipment item number of the system instrument owned to an end user was incorporated will remain for example, on a hard disk as a result. A user transmits a file to flash plate memory card, for example using a general-purpose adapter card. When this flash plate memory card is inserted in a system instrument, refer to the storing field of the information related with the equipment item number in a file for a system. When agreement is checked by the information relevant to the own equipment item number of a system and the equipment item

number in a file, a system recognizes that the file is a file of normal, and permits playback of a musical piece. If agreement is not obtained, it is recognized as the file which came to hand unjustly, and playback of a musical piece is forbidden. Therefore, if this example is followed, the file which came to hand through the Internet can be used only with a specific system instrument. When it inserts in an alien-system device, since the information in an equipment item number and a file does not agree, the above-mentioned flash plate memory card cannot be used. Therefore, data distribution in this example was not performed to specific flash plate memory card, but it means that it was performed for [specific] system instruments. The case where the file which remains on the hard disk here is transmitted to another flash plate memory card is considered. In this case, the file on a hard disk can be copied to other flash plate memory card by the sound condition at infinity. However, in the file transmitted in those memory cards, the equipment item number of a system from the first as a system by which the file operates is incorporated. Therefore, although a copy is made to an inexhaustible supply, the system which can use it is restricted to the specific system instrument to the last, and copyright will be protected.

[0065] Although a certain file was able to be used only by a certain specific system, you may enable it to use it by two or more systems in the above-mentioned example. When downloading from the Internet, one equipment item number was able to be inputted in the above-mentioned example, but it is good even if a setup of at least two or more equipment item numbers is possible. Considering the case where one individual has two or more devices, it is effective. You may have a means, for example, a management flag, by which the equipment item number which forbids use besides an usable equipment item number can also be stored. For example, when two sets of devices are registered at the beginning and it abandons the royalty of the file on an one-set system instrument among those, actuation which deletes device registration is attained. As a means in the case of increasing the number of registration of an usable device, the file itself which increased the number of registration may be transmitted from the Internet, and only the software which operates addition of a registration device may be transmitted to the file currently kept by hard disk superiors. namely, the number and the applicable equipment item number of a device proper of a system instrument -- relation -- the price -- **** -- information -- the file which comes to hand in the incorporated form exists, and if the addition of an equipment item number, deletion, etc. have the means which can change the number of registered devices, in the system by which a system instrument checks agreement of both information, and judges propriety of operation, they will agree with the main point of this invention with a certain means.

[0066] Although it corresponded in the above-mentioned example by updating the support device information stored in the file when the number of the devices which use a file had fluctuation, the approach that the equipment item number is changed may be taken by the system instrument side. When the end user owns the device of the equipment item number of No. 100, and the system instrument of No. 200, suppose that many files which came to hand by a certain approach on the assumption that the equipment item number of No. 100 (for example, from the Internet) were used. When it is thought that an end user wants to use these files by the device of No. 200, depending on the quantity of a file, as for corresponding by renewal of the support equipment item number in the file explained in the above-mentioned example, serious trouble may be needed. In this case, what is necessary is just to have the means which can be changed into No. 100 for the equipment item number of No. 200. That is, if two sets of equipment item numbers are unified, a file type can be communalized and used by one kind. Various kinds of approaches can be considered as a concrete means of a device changed number. For example, actuation of the input key of a system instrument may realize, the software of a device changed number is distributed from the Internet, it is transmitted on flash plate memory card, and an equipment item number may be changed by performing applicable software on a system instrument. Since that an equipment item number can be changed without any restriction has a problem, the above-mentioned device changed-number software should just be distributed in the form where the equipment item number from the first and the equipment item number to change of the system instrument changed were specified. Moreover, you may make it the form where not only simple modification but one system instrument has two or more equipment item numbers. For example, if it is made the form where a device

with the equipment item number of No. 100 united and has the equipment item number of No. 200, the file which was being used by the device of No. 200 from the first besides the file for No. 100 can also be used, uniting.

[0067] Thus, it is characterized by the ability of the equipment item number information on a proper etc. to update the main point of this example at a system instrument including modification, an addition, deletion, etc. Moreover, it is also the description to make it the form where it is not fixed to a piece but an equipment item number has two or more equipment item numbers. Moreover, it may be made to make a change of an equipment item number on manufacture or the selling side of a system instrument. For example, the service which can purchase the new system instrument which had the same equipment item number after sending the original system instrument to the above-mentioned manufacture or a selling side, when the owned system instrument broke down and a system instrument was newly purchased may be prepared. Also when purchasing a system instrument by addition, you may enable it to purchase that to which the same equipment item number as the opportunity system machine owned to the system instrument purchased newly with a means to prove owning the current system instrument until now was set.

[0068] Moreover, the information related with the identification code in a file is a wide sense. The file is enciphered on the whole or partially, and the key which solves the code could be connected with the identification code itself or identification code. In this case, the thing which solve a code normally and which is put in another way as the ability not to solve is possible for the agreement with the information related with identification code and the identification code in a file, and an inequality.

[0069] (The 6th example) Next, the 6th example of the memory system of the invention in this application is explained. Although the example of the above 1-5 took the technique of recognizing flash plate memory card and a system instrument according to an individual, it is a thing of making a user individual recognize in this example.

[0070] In order to simplify explanation, an individual birth date is explained to an example here. As individual identification information, it is not restricted only to a birth date. A name may be used, the personal identification number set as arbitration is sufficient, and the member number of a credit card, a social security number, etc. are sufficient, and there is also no need of differing from others by 100% of probability. It is good if it differs from others by a certain probability. The case where the end user who purchased the system instrument (a ****** playback machine is taken for an example here) purchases a music file from on the Internet is taken for an example.

[0071] The above-mentioned identification information is incorporated by the system instrument. The approach of incorporating is arbitrary. In case a system instrument is purchased in a store, a vender side may set up, and it does not matter even if the end user after purchase sets up himself. In case an end user purchases a file from on the Internet, he sets up the specified identification information. (For example, birth date) In a file, the information related with a birth date or it is incorporated. A system instrument compares the identification information currently held on the device with the identification information incorporated in the file, and only when agreement is seen, it permits musical playback. The description of this example becomes possible [using one file in common on all devices], when individual identification information is incorporated by the file and the end user has two or more system instruments. Convenience is very high when the case where failure occurs to one of the possessed devices when an end user does additional purchase of the system instrument is assumed. It is also the same as when an individual name is used instead of a birth date. A file can be freely copied to two or more flash plate memory card from a hard disk. However, playback is unreproducible except the system instrument which the individual who purchased the file owns. The probability is very low although it is reusable between people with the same birth date, and the man of a same surname same name. Of course, if it is used combining two or more identification information (a birth date and name), the probability will serve as zero as a matter of fact, and copyright will be protected. Moreover, the identification information on a device and the identification information in a file can be made to perform addition, modification, deletion, etc. It becomes possible the case where a name is changed by marriage etc., and to transfer a right to others.

[0072] Moreover, the information related with the identification code in a file is a wide sense. The file is enciphered on the whole or partially, and the key which solves the code could be connected with the identification code itself or identification code. In this case, the thing which solve a code normally and which is put in another way as the ability not to solve is possible for the agreement with the information related with identification code and the identification code in a file, and an inequality.

[0073] (The 7th example) Next, the 7th example of the memory system of the invention in this application is explained as an approach of raising security further. Although the old example indicated the approach of protection of copyrights for ordinary end users, it stands on the viewpoint which prevents that a third person with malice performs a malfeasance in this example. For example, generally the electric interface specification of flash memory card is exhibited through the information on the Internet etc. Therefore, it is not technically impossible to create a special tool which carries out the dead copy of the data in a memory card from a certain memory card faithfully per cutting tool to another memory card not as a file unit but as an aggregate of mere binary data. In this case, another memory card with the completely same data stream as an original memory card will be made, and a system instrument is difficult to distinguish these. This example was made in view of the above-mentioned trouble, and presents the countermeasures over dead copy actuation.

[0074] The main point of this example is that give the identification code which identifies a memory card according to an individual, and incorporate this identification code or the associated information also in a file, and a system instrument checks agreement of both information to the field which cannot be accessed for the information currently generally released, or the field which cannot perform free data rewriting even if accessed.

[0075] For example, the non-volatile semiconductor memory containing the flash memory card shown in drawing 1 has the mode of operation generally called ID lead. This mode is the mode for the exterior to notify the manufacture manufacturer of memory, classification, capacity, an electric specification, etc. For example, in the flash plate memory card which drawing 1 was shown, it performs by technique as shown in drawing 15 . An injection of ID lead command (here 90h) carries out the sequential output of the device code (Device Code) which shows the classification of the code (Maker Code) and memory which show a manufacture manufacturer. For example, when the 64-megabit flash memory card by Toshiba Corp. is taken for an example, it is JEDIC to the 1st byte. ID98h is outputted and device code E6h which shows that it is an of operation power-source 3.3V article NAND mold flash memory by 64 megabits is outputted to the 2nd byte. If it is not a flash memory but a mask ROM, D6h will be outputted even for the 64-megabit same memory. A system instrument reads such information and performs control which suited the specification of a device.

[0076] Actuation of this ID lead actuation is made to extend in this invention. It is made to output the identification information of a memory card proper after an output required of original ID lead actuation, as shown in drawing 16 . The output of the above-mentioned identification information begins from what byte, and what byte continues has a degree of freedom. After [which presents that it is supporting first itself] outputting (AAh etc. sets up data with the small probability for data to exist on a bus by chance), you may make it make identification code output, in order to ensure distinction of the conventional product and the product which is supporting this function. This identification code is already all the flash memory card 1 like description. It is not necessary about every [**] to be unique (proper) (a thing peculiar natural is desirable). For example, when identification code is formed by 1 byte, as a value which can be taken, they are 256 kinds from 00h to FFh. Therefore, flash plate memory card can be classified into 256 kinds of groups. Even in this case, if the probability to have the memory card which there are two end users and has the same identification code is taken into consideration, it will be thought that it is sufficiently low.

[0077] Moreover, in the above-mentioned example, although the existing ID lead command was diverted, the lead command of identification code may newly be specified separately. Compared with using ID lead command with which the access approach is exhibited, safety is high. The outline in this case is shown in drawing 17 . Although a command setup of 1 cycle was illustrated as a lead command of identification code here, two or more bytes of command input may be needed.

[0078] Moreover, various the decision approaches of identification code are considered. The approach of determining in the manufacture phase of flash memory card first is illustrated. The set point may be carried out as [identify / like / every sheet / to the serial number / nearly completely], may be determined in the wafer unit which is made to generate a random number and may be determined, and may be set up per chip. If a value is set up so that it may have the identification code in which a memory card differs from other memory cards by a certain probability, it will have agreed completely with the main point of this invention. It may not determine by the manufacture manufacturer of a memory card, for example, you may determine by the manufacturer who memorizes and sells a work.

[0079] Moreover, various the write-in approaches of identification code are also considered. The approach of writing in in the manufacture phase of flash memory card first is illustrated. For example, there is the approach of using a fuse, as shown in <u>drawing 18</u> . In the time of not cutting, the value which this circuit holds to the power up differs from the time of cutting a fuse. These at least one or more circuits are prepared, and it determines whether to cut a fuse with the value of the identification code to set up, or not cut. For example, an injection of the lead command of identification code outputs the value currently held in this circuit to the exterior through an output buffer. Various assumptions can be carried out as a class of fuse. Anything that what is burned off by laser, the thing which passes a current and burns off electric wiring thermally, and the fuse itself consist of nonvolatile memory like EEPROM, and demonstrates the same effectiveness as an electric fuse etc. is good. Moreover, it is good also as a bonding option at the time of carrying out the assembly of the chip. Although the pad for connecting golden wiring etc. is prepared on the chip and the pad is electrically connected to VCC, for example, you may make it the value to hold change by whether it connects with GRD. Moreover, it is good also by using properly the mask of the wiring layer used at the time of manufacture. For example, if a mask is properly used two or more kinds at the process which forms the wiring layer of the aluminum near the final process of manufacture, a setup of **** identification code is possible in a certain amount of variety. In addition, it is good to be able to set it as the extent machine target which is the form which embeds a small DIP switch, and also make. Moreover, apart from flash memory card, it has another nonvolatile memory holding identification code, and the value of identification code may be made to be acquired from the another nonvolatile memory. Namely, what is necessary is just to make it carry a certain IC and components which are used into flash memory card for protection of copyrights in a flash memory and coincidence. The identification code according to individual should just be written in in a memory card in a manufacture phase by a certain technique. Identification code may be set up so that it cannot rewrite henceforth by cutting an electric fuse etc., EEPROM etc. is used instead of a fuse, and even if it makes it the structure which can be rewritten henceforth, it is not cared about. When this rewriting is possible, if it has a means which makes rewriting after a certain time impossible if needed, for example, the mode rewriting becomes impossible henceforth by cutting an electric fuse, versatility will spread.

[0080] Moreover, the information related with the identification code in a file is a wide sense. The file is enciphered on the whole or partially, and it could be connected with the identification code of key ** which solves the code itself, or identification code. In this case, the thing which solve a code normally and which is put in another way as the ability not to solve is possible for the agreement with the information related with identification code and the identification code in a file, and an inequality.

[0081] (The 8th example) Next, the 8th example of the memory system of the invention in this application is explained as a gestalt from which the 7th example of the above differs further. Let it be main point unlike the above-mentioned example 7, for this example to prepare room where a user's use field is another into a flash memory, and to store the identification information according to individual of flash plate memory card on the room.

[0082] For example, in the case of 64-megabit memory, naturally, the room where a user is usable is secured by 64 megabit, but it has room other than the room for this 64 megabit, and identification information is held in it. Of course, it enables it to access this redundant room by different approach from the approach of accessing the room of the normal for 64 megabit.

[0083] The outline of the physical block of this flash memory is shown in <u>drawing 19</u> . For example, in

the case of the 64-megabit flash memory, the memory cell array is divided into the block (elimination unit) of 1024 per 64 kilobits. Eight redundant blocks other than these 1024 blocks are prepared. When a bad block is discovered at the time of manufacture as generally known, these redundancy blocks may be used also [block / which is prepared for the processing which permutes a block], and may be prepared separately. The special command for accessing this redundant block is prepared (it is henceforth called a redundancy block access command). The identification code for identifying a memory card according to an individual is written in this redundancy block. In which phase identification code is written in as the example 7 explained has a degree of freedom. For example, it supposes that identification code was written in this field in the manufacture phase, and in case considering the case which sells to the memory card by storing a work a work is written in, a write-in tool reads the identification code written in the redundancy block with a redundancy block access command. Next, the information related with this read identification code or identification code is incorporated in a file, and a file is written in a memory card. A system instrument compares the identification code of the memory card written in the redundancy block with the identification information of the memory card incorporated in the file, and when predetermined conditions are fulfilled, it permits the use on a system instrument. Since the identification information of the identification code written in the redundancy block in the memory card of the destination of a copy file and the memory card incorporated by the copied file does not agree even if it is transmitted to another memory card through a hard disk etc. from a memory card with a file and you are going to make it operate on another system instrument, it cannot be used. The right of a work will be protected by this.

[0084] Many things are considered to have described the gestalt of the identification information of the memory card written in this redundancy block in an old example. In case the identification code of a memory card may be stored simply, are stored and are actually used, you may compare and use it. [two or more] Moreover, the additional information for judging the validity of identification code may be attached. For example, when parity was calculated, it stored with the count result, or it stores with the sign for error corrections and an error occurs, it is good also as an error correction being possible. Moreover, you may make it store identification code with the complement (for it to be 55h as the complement, if identification code is AAh). Moreover, it is good for the method of ECC currently used in case an actual file is stored by the memory card of drawing 1 to be able to apply as it is, and also make. Moreover, identification code may be stored in two or more pages if 1 block is constituted from 16 pages by the flash memory illustrated to drawing 1 . Moreover, it may be stored in two or more blocks. Moreover, the information (for example, specified character string of one or more characters) for checking that the redundancy block other than identification code stores identification code and the corresponding redundancy block may be stored with management data like a flag in which a normal thing or a bad block is shown electrically. For example, if 2 blocks (a priority may be established) are prepared as a field for storing identification code, even when one of them is a defect's block temporarily, it is not necessary to drop the manufacture yield. In this case, as a system instrument, a management flag is seen first, and it judges whether it is a normal block, and judges whether next identification code is stored by the existence of a regular character string. Identification code is acquired judging identification code validity using the means of parity and others, if a regular character string is found. If the block accessed first is a bad block, going to access to block [of a degree] is obvious. In addition, although various approaches can be considered, if the identification information according to memory card individual is stored in the field which a user cannot access easily, it will agree with the main point of this invention, as the example 7 described.

[0085] Moreover, the information related with the identification code in a file is a wide sense. The file is enciphered on the whole or partially, and the key which solves the code could be connected with the identification code itself or identification code. In this case, the thing which solve a code normally and which is put in another way as the ability not to solve is possible for the agreement with the information related with identification code and the identification code in a file, and an inequality.

[0086] (The 9th example) Next, the 9th example of the memory system of the invention in this application of the gestalt which strengthened further the 8th example mentioned above is explained.

Since the approach of forbidding rewriting of identification code is not specified, when the access approach to a redundancy block flows out, the inaccurate tool which rewrites the data of an applicable field should not be made from an example 8, either. This example adds further the measure of forbidding rewriting of identification code to the approach indicated in the example 8.

[0087] A concrete example is explained using drawing 19 . For example, in the case of the 64-megabit flash memory, the memory cell array is divided into the block (elimination unit) of 1024 per 64 kilobits. Eight redundant blocks other than these 1024 blocks are prepared. The low decoder as shown in drawing 20 is attached to each of the block shown here. Explanation is added about the function of this low decoder.

[0088] A low decoder circuit chooses a block according to the address inputted into a chip, and bears the role which transmits the electrical potential difference generated all over the circumference circuit in the word line etc. Usually, the above-mentioned actuation is performed in all data writing, the data elimination, and data readout. Below, actuation of a low decoder circuit is explained according to drawing 20 .

[0089] Signal RDEC is a seizing signal of a low decoder, and serves as "H" at the time of actuation of writing, elimination, and read-out. Signal ADDRESS is a signal showing a block address, two or more address signals [block / with which the address was chosen] of all serve as "H", and Node NA also serves as "H". At the time of write-in actuation and read-out actuation, "L", and a signal/ERASE serve as [Signal ERASE] "H", it is transmitted, that is, Node NO serves as "H" in the block to which the signal was chosen as Node NO through "the signal path 1", and is served as to "L" by the other block. Then, in a selection block, it is set to node N1=VPP (high voltage for realizing writing, elimination, read-out, etc.), and /N1=0V, and propagation (refer to the circuit in a broken line at the lower right of drawing), and the writing and read-out of data are performed for the electrical potential difference of a circumference circuit section bus line by the word line. Moreover, in a non-choosing block, it is set to N1=0V and /N1=VPP, and a circumference circuit section bus line and a word line are in a connectionless condition.

[0090] Next, the detailed actuation under elimination actuation is explained below. Since Signal RESET is in the condition of "H" before elimination actuation initiation, Nodes NL and NR are in "H" and the level of "L", respectively. If elimination actuation begins, Signal RESET is set to "L", and address signal ADDRESS will be set up according to the address inputted into the chip, and it will become fixed time amount"H" which has Signal LEST further. In a selection block, since Node NL is connected with 0V through FUSE when FUSE is in the condition of not cutting, since Node NA is in "H", Nodes NL and NR serve as "L" and "H", respectively. On the other hand, in the block which has FUSE in a cutting condition, it does not depend on selection and un-choosing, but, as for Nodes NL and NR, "H" and the condition of "L" are maintained, respectively. [of a block] Then, "H", a signal / ERASE is set to "L" by Signal ERASE, a signal gets across to Node NO through "a signal path 1", that is, data elimination is performed only to the block which the electrical potential difference of Node NR has in NO, and has propagation and Node NR in "H" level.

[0091] In the low decoder circuit in drawing 20 R> 0, it performs selection / un-choosing using a direct-address signal, and, on the other hand, performs selection / un-choosing using the latch circuit in a circuit so that clearly from having stated above. [of the block at the time of data writing and read-out] [of the block at the time of data elimination] Therefore, by the block from which FUSE was cut, the writing and read-out of data can make impossible activation of the activation possibility of and data elimination by using the circuit in drawing 20 .

[0092] When the above-mentioned low decoder is used, it controls as follows. For example, the command which accesses a redundancy block is prepared. The identification code of a proper is written in this field at a memory card. It has already indicated that various approaches can be assumed about a write-in format of identification code in the example 8 grade. In this example, FUSE is cut, after writing in identification code. It is description that the class of fuse can take the thing of a laser cut, an electric fuse, EEPROM, etc. If FUSE is cut, although writing and read-out become possible, elimination actuation will be forbidden like description. Therefore, even if the access approach to an applicable field

flows out, the information stored in the applicable field cannot be rewritten freely. However, write-in actuation has not forbidden in this example. Therefore, additional write-in actuation is possible. Although it is possible for the flash memory in this example to rewrite the data of "1" without elimination actuation to "0", the data of "0" cannot be rewritten to "1." Therefore, what is necessary is just to write in the complement other than identification code at the time of **, in case the identification information of a memory card is stored. For example, the complement will be set to "55h=01010101" if identification information sets to "AAh=10101010." Even if it carries out the additional writing of the most significant bit of AAh of identification code and rewrites to "2Ah=00101010" by unjust actuation, a corresponding complement storing field cannot be rewritten to "D5h=11010101." Therefore, by storing identification code with a complement, it becomes impossible additional to write [inaccurate] in, and even if the access approach to an applicable field and an approach write-in [additional] are known, the rewriting action of meaningful data can be performed to an applicable field. Therefore, the identification code which identifies a memory card according to an individual is written to this field. In the system instrument of the structure which identification code or the associated information is incorporated in a file, and restricts the actuation on a system by the comparison of both information Since there is a storing field of identification information also like the memory card of the destination and rewriting of the information is similarly restricted even if it copies a file to another memory card There is no agreement of the identification information and information in a file, and it cannot be used on a system instrument, but the right of a work is protected. After shipment of a memory card, when writing information in this field at the time of the manufacturer who stores a work, if it is after identification information storing (for example, an electric fuse), the fuse will be cut electrically and rewriting of subsequent inaccurate identification information will be forbidden. although only elimination actuation was forbidden here -- the same means -- the write-in actuation of an applicable field itself may be forbidden. When the applicable field which is not restricted only to the fuse of the low decoder neighborhood as a means to forbid elimination and writing has access, it is very good in a means by which actuation of the generating circuit of the high voltage required for writing and elimination is forbidden, and arbitrary. After storing identification information, with a certain means, actuation of either elimination actuation of an applicable field or write-in actuation and both is forbidden, and ** satisfies the main point of this invention. The approach that elimination and the write-in actuation of elimination or the write-in actuation once forbidden are again attained through a still more complicated procedure may be held.

[0093] In the above-mentioned example, although the identification code of a memory card was stored in the redundancy block, this invention is not restricted to this. You may store in usual room fields other than a redundancy block. In the memory card shown in <u>drawing 1</u> , defect registration of a block in a block unit is possible like description. After defining a certain block as the storing block of identification code and writing in identification code there, you may make it the means of cutting with a fuse protect rewriting of inaccurate identification code. In order to prevent trying in order that a this time usual system may use an applicable block as a usual data storage field, the information relevant to identification code is stored, and also it is Block of a block. What is necessary is to attach a mark to StatusArea and just to carry out bad block registration. What is necessary is just to store the information which can check storing identification code also in these cases like description together. What is necessary is just to make it forbid actuation of either elimination actuation or write-in actuation and both, after they write in identification code at the time of shipment of all memory cards and cut a fuze, since the dead copy of the data of a certain memory card ** must not be carried out to other media, when using this approach. Therefore, identification code is memorized to the usual room, and if it has a means by which actuation of either subsequent elimination actuation or write-in actuation and both is forbidden, to the applicable field, the main point of this invention will be satisfied. Moreover, in 1 to nine of the above-mentioned example, in order to simplify explanation, it is only indicated as the identification number of a memory card, but it does not matter even if it is information (for example, it may not be directly [characteristic property of a memory card own /, such as a vender, a singer, a composer, a songwriter, a manufacturer a record company, an album name, and a station name / and]

related in the case of a music file) for it to identify not only the identification number of a memory card but a work directly simply.

[0094] Moreover, the information related with the identification code in a file is a wide sense. The file is enciphered on the whole or partially, and the key which solves the code could be connected with the identification code itself or identification code. In this case, the thing which solve a code normally and which is put in another way as the ability not to solve is possible for the agreement with the information related with identification code and the identification code in a file, and an inequality.

[0095] (The 10th example) Next, the 10th example of the memory system of the invention in this application is explained. This example is related with the defense function to a tool which carries out the dead copy of the data.

[0096] Here, a defect bit is given to the interior of memory by suitable frequency at random. Even if it is going to read data from the original memory card in order to reproduce the contents of the nonvolatile memory which is a storage at this time, and it is going to perform a dead copy to the memory card of a duplicate place, data cannot be correctly written in that part by existence of the defect bit which exists in the memory of a writing place, and it cannot copy correctly, but an unjust data copy ends in failure. The above-mentioned defect bit can expect the same effectiveness also in the defect bit arranged [the congenital defect bit or] artificially. Furthermore, a defect does not need to be a bit and can expect the same effectiveness also by the nonvolatile memory which has by nature or artificially the low defect, the poor column, the poor block, and those combination other than a bit.

[0097] As a means which arises artificially and cheats out of a defect bit, a low, a column, or a block, destruction of the cel transistor by laser radiation, a low decoder, a column decoder, or a block decoder can be considered. Moreover, a polish recon fuse or an electric fuse is similarly prepared between a cel, a low, a column or blocks, and those decoders, and the technique of melting it by laser and the overcurrent is also considered. Furthermore, it is One. Time It is possible by preparing the cel of nonvolatile memory, such as PROM, and writing in the cel to make a defect artificially [making one or those combination in the above-mentioned defect artificially etc.] in the range which does not deviate from the meaning of this invention. Either elimination actuation or write-in actuation and both actuation may be forbidden by technique which was explained in the examples 8 or 9. If "0" data are beforehand written in the applicable field when forbidding only elimination actuation, since a copy of data is not made, the same effectiveness will show up. When it is going to perform the dead copy of data, if measures in which a copy fails are taken by a certain approach, it will agree with the main point of this example.

[0098] (The 11th example) Next, the 11th example of the memory system of the invention in this application is explained. Although the structure of right protection of a work was explained in the example of the above 1-10, distinction of the memory card which has the right protection feature of a work, and the card which is not so is possible, and it is good to also make. Various the approaches of distinction are considered. For example, the text which means that the copyright protection feature sticks in the sheathing front face of a memory card, and the logo mark may stick. Moreover, a convention of a color or a pattern may be performed and you may decide for it to have a copyright protection feature. Moreover, you may make it a product name and a product part number show. Moreover, when a system instrument is inserted, you may make it a message come out on a display. Moreover, in case a file is dealt with on PC, structure out of which a message etc. comes is sufficient. Moreover, what is necessary is just to be able to distinguish by some specific actuation (for example, special command which outputs whether the copyright protection feature sticks), although it already described so that the part equivalent to the controller in a system instrument could be distinguished.

[0099] Moreover, it is good to be able to distinguish whether protection of the above copyrights is carried out per a file unit or directory, and also make it. Moreover, you may enable it to distinguish whether they are that it is a thing without the need for protection of copyrights, or the thing made inaccurate in the copy etc. supposing a thing without the need for protection with works, such as music created privately and music for promotions. If a flag is formed in the predetermined field in a file and it is judged as a thing without the need for protection of copyrights, even if the conditions about protection

of copyrights which has so far been indicated are not satisfied, on a system instrument, it is usable and good to also make.

[0100] Although flash memory card was explained to the example in 11 examples from the above 1, this invention is not restricted to flash memory card and a pan only at semiconductor memory. It does not matter since a function (the identification code explained in the above-mentioned examples 1-11 in this case may turn MROM) which the whole card may be constituted from a mask ROM (MROM), and was explained in the above-mentioned examples 1-11 with MROM is incorporated, even if data writing, the flash memory which can set up identification code, OTP (One Time PROM), a fuse, etc. accompany.

[0101] Furthermore, this invention is restricted to the above-mentioned example, is not a thing, and changes variously and is available in the range which does not deviate from main point. Moreover, right protection of these works may not be used only by 11 independent one or the combined thing from the above-mentioned example 1. For example, it may be used with a digital-watermarking technique and encoding technology.

[0102]

[Effect of the Invention] The invention in this application prepares the field holding the information which identifies a memory card according to an individual on a memory card, is offering the various approaches of reading the data memorized by the memory card based on this information, and adds the function of the copy guard aiming at protection of copyrights to the file on a memory card.

[Translation done.]